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Title : Numerical Techniques for Solution of Rayleigh-Benard Thermal Stability Problem using Chebyshev Collocation Method		*Document No.* PD EA-9208 *Date of issue*: July 92
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Abstract :

Most of the stability problems in Fluid Mechanics may be reduced to algebraic eigenvalue problems by certain simplifying assumptions. The problem still poses a difficulity in solving, due to the non-linearity of the eigenvalue appearing in the equation. An algorithm to solve this type of problem is presented and applied to a specific problem, namely the Rayleigh-Benard Thermal stability problem. The differential equations governing the phenomenon are reduced to algebraic form using the Chebyshev-Gauss-Lobatto collocation method.

On applying boundary conditions (free-free), an over-determined system of equations is obtained. With suitable matrix manipulation, this may be reduced to a general eigenvalue problem. The resulting algebraic form of the generalised eigenvalue problem is solved using the QZ algorithm.